

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Simone Mazzoni et al.
Application No. : 10/761,708
Filed : January 21, 2004
For : GENERATION OF A GUARD INTERVAL IN A DMT
MODULATION TRANSMISSION

Examiner : Toan D. Nguyen
Art Unit : 2416
Date of Notice
of Allowance : August 4, 2009
Docket No. : 859063.462C1
Date : November 3, 2009

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

COMMENTS ON NOTICE OF ALLOWABILITY REGARDING PRIORITY DOCUMENT

Commissioner for Patents:

On the Notice of Allowability the Examiner indicates that none of the Certified copies of the priority documents have been received. Applicants would like to point out that this is a Continuation application based on U.S. Application No. 09/491,685 (abandoned) and the Certified Copy of French Priority Document was filed in the parent matter on January 26, 2000. Please find attached a copy of the Final Rejection issued in the parent matter on October 21, 2003 indicating that the Priority Document was received and acknowledged in U.S. Application No. 09/491,685.


A telephone conference was conducted with Examiner William Trost on November 3, 2009, where Examiner Trost said a Supplemental Notice of Allowance would be

Application No. 10/761,708
Comments on Notice of Allowability Regarding Priority Document

mailed to confirm receipt of the priority documents. These comments are being submitted as confirmation of that conversation.

Respectfully submitted,

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/491,685	01/26/2000	Simone Mazzoni	859063.462	8905

500 7590 10/21/2003

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EXAMINER

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ART UNIT

PAPER NUMBER

2665

DATE MAILED: 10/21/2003

RECEIVED

OCT 23 2003

SEED INTELLECTUAL PROPERTY
LAW GROUP PLLC

Please find below and/or attached an Office communication concerning this application or proceeding.

2 - month Response Due: Dec 21, 2003

3 - month Response Due: Jan 21, 2004

Notice of Appeal Due: Apr 21, 2004

(6 - month period ends) Will Go Ahan

(3 - month extension of time required)

FINAL REJECTION

ENTERED IN DOCKET

Office Action Summary

Application No.

09/491,685

Applicant(s)

Mazzoni et al.

Examiner

Man Phan

Art Unit

2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on May 12, 2003
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Jan 26, 2000 is/are a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

Response to Amendment and Argument

1. This communication is in response to applicant's 05/12/2003 Amendment in the application of Mazzoni et al. for a "Generation of guard interval in a DMT modulation transmission" filed 01/26/2000. This application claims foreign priority based on the applications 99/01062 dated 01/27/1999 filed in France. The proposed amendments to the claims have been entered and made of record. Claim 5 has been amended, and newly claims 6-14 have been added. Claims 1-14 are pending in the application.

2. The objection of record with respect to the Abstract of the disclosure is hereby removed based on applicant's amendment.

3. Applicant's amendment and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C.103 as discussed below. Applicants' argument with respect to the pending claims have been fully considered, but they are not persuasive for at least the following reasons.

4. First, Applicant asserts that there is no motivation to combine the references (page 7, last paragraph) i.e., Hayashino et al. (US#5,682,376) and Ladstatter (US#4,112,430) as proposed in the Office Action. In response, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce

the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, Hayashino et al. and Ladstatter are applied herein for the teaching of a method of transmitting multiplex signal including symbols of prescribed lengths and guard intervals of prescribed lengths which are arranged between the symbols. As well known in the art, an OFDM transmission system is adapted to divide coded data and sort the same into at least hundreds of carriers, for multiplexing and transmitting the data. Thus, causes no waveform distortion in a data component of each symbol on the frequency axis after Fourier transmission. The prior art also provides a method of transmitting multiplex signal which can readily adjust a time window on the time axis even (frequency shifting) if a time delay is caused in the multiplex signal before the same reaches a receiving side from a transmission side. Ladstatter's teaching of the phase shifters for shifting the phase on the signal which is proportional to the frequency of the Fourier coefficient into Hayashino's circuit for generating a cyclic prefix of a symbol on

the frequency axis after Fourier transformation meet the limitation of the claims, and improved the prior art's OFDM transmission reliability as admitted by the applicant.

5. Applicant's argument with respect to the rejected claims 1, 3 and 5 (page 8, first paragraph) that the cited references - Hayashino does not suggest that there are any problems with this way to generate cyclic prefixes, does not recognize that the Hayashino approach would involve the use of a large memory and introduce a long delay, and does not suggest that any improvement has to be implemented to reduce the memory size or the delay. However, these are not the claimed limitations, and they have no support in the claims. Rather, Hayashino discloses an OFDM transmission method including symbols of prescribed lengths and guard intervals of prescribed lengths which are arranged between the symbols. An inverse Fourier transformer performs inverse Fourier transformation on an output of the complex multiplier, for transforming a digital signal which is multiplexed on the frequency axis to an OFDM signal on the time axis. A guard interval insertion part adds front and rear guard intervals to front and rear parts of each symbol of the OFDM signal respectively. The front and rear guard intervals include data which are identical to those of rear and front end parts of the corresponding symbol respectively. Arithmetic processing which is reverse to that on a transmission side is performed on a receiving side, whereby distortion of received data is removed. Thus, the OFDM signal can be transmitted with no waveform distortion on a data component of each symbol on the frequency axis after Fourier transformation even if a reflected wave is

superposed on a direct wave due to a multipath (Figs. 1&9; Col. 3, lines 38 plus).

Furthermore, Ladstatter teaches in the IFFT process in which using the phase shifters for shifting the phase on the signal which is proportional to the frequency of the Fourier coefficient. Therefore, Examiner maintains that the references cited and applied in the last office actions for the rejection of the claims are maintained in this office action.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3 and 5, 7 and 9, 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashino et al. (US#5,682,376) in view of Ladstatter (US#4,112,430).

With respect to claims 1 and 3, Hayashino et al. discloses a method of transmitting an orthogonal frequency division multiplex signal using guard intervals arranged between the symbols according to the essential features of claim 1. A circuit for generating a cyclic prefix (G) of a symbol comprises of a sequence of samples (S) in the time domain, the prefix being the reproduction of the last samples of the symbol at the

beginning of the symbol (Figs. 12, 13; Col. 1, line 66 to Col. 2, line 6), the symbol being obtained by inverse Fourier transform of complex coefficients corresponding to respective frequencies (Col. 3, line 62 to Col. 4, line 6). Hayashino further teaches in Fig. 2 illustrated a memory 26 for storing the samples and the reproducing part 24 for copying the stored samples.

However, Hayashino does not expressly disclose the means for shifting the phase of each complex coefficient by a value proportional to its frequency, so that the last samples of the symbol are shifted at the beginning of the symbol according to a circular permutation. Ladstatter (US#4,112,430) discloses in Fig. 2 illustrated how wideband signals can be time delayed and advanced by the use of phase shifts and Fourier transform, in which the phase shifter impresses a phase shift on the signal which is proportional to the frequency of the Fourier coefficient, when the multitude of narrowband signals is subjected to the inverse FFT, the results will be a circular shift of the input signal (Col. 3, line 65 to Col. 4, line 5).

Regarding claims 5, 7 and 9, 11-12, they are method claims corresponding to the apparatus claims 1, 3 above. Therefore, claims 5 and 7 are analyzed and rejected as previously discussed with respect to claims 1, 3.

One skilled in the art would have recognized the need for effectively and efficiently generating guard interval in DMT modulation transmission, and would have applied Ladstatter' teaching of the phase shifter in associated with the frequency of the Fourier coefficient into Hayashino's circuit for generating a cyclic prefix of a symbol in

an OFDM modulation transmission. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Ladstatter's beamformer for wideband signals into Hayashino's method of transmitting OFDM signal and transmitter/receiver employed therefor with the motivation being to provide a method and apparatus for the generation of a guard interval in a DMT modulation transmission.

8. Claims 2, 4 and 6, 8 and 10, 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashino et al. (US#5,682,376) in view of Ladstatter (US#4,112,430) as applied to the claims above, and further in view of Marchok et al. (US#6,285,654).

With respect to claims 2 and 4, these claims differ from claims 1, 3 and 9, 11-12 above in that the claims require a multiplier connected to multiply each complex coefficient, and a multiplexer connected to the input and output of the memory. In the same field of endeavor, Marchok et al. (US#6,285,654) discloses in Fig. 13 illustrated an exemplary implementation of the partial sequence filter, including a digital multiplier 650 where it is multiplied by the coefficient supplied from coefficient table memory 655 (Col. 13, lines 58-62); a multiplexer 625, a first input and a second input of which are respectively connected to the input and to the output of the memory 670 (Col. 13, lines 27-43).

Regarding claims 6, 8 and 10, 13-14, they are method claims corresponding to the apparatus claims 2, 4 above. Therefore, claims 6 and 8 are analyzed and rejected as previously discussed with respect to claims 2, 4.

One skilled in the art would have recognized the need for effectively and efficiently generating guard interval in DMT modulation transmission, and would have applied Marchok's novel use of the multiplier and multiplexer in the cyclic prefix generation circuit and Ladstatter's teaching of the phase shifter in association with the frequency of the Fourier coefficient into Hayashino's circuit for generating a cyclic prefix of a symbol in an OFDM modulation transmission. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Marchok's apparatus and method for symbol alignment in a multi-point OFDM or DMT digital communications system, and Ladstatter's beamformer for wideband signals into Hayashino's method of transmitting OFDM signal and transmitter/receiver employed therefor with the motivation being to provide a method and apparatus for the generation of a guard interval in a DMT modulation transmission.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (703)305-1029. The examiner can normally be reached on Mon - Fri from 6:30 to 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (703) 308-6602. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3988.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Mphan

10/10/2003.

MP



STEVEN H. D NGUYEN
PRIMARY EXAMINER